

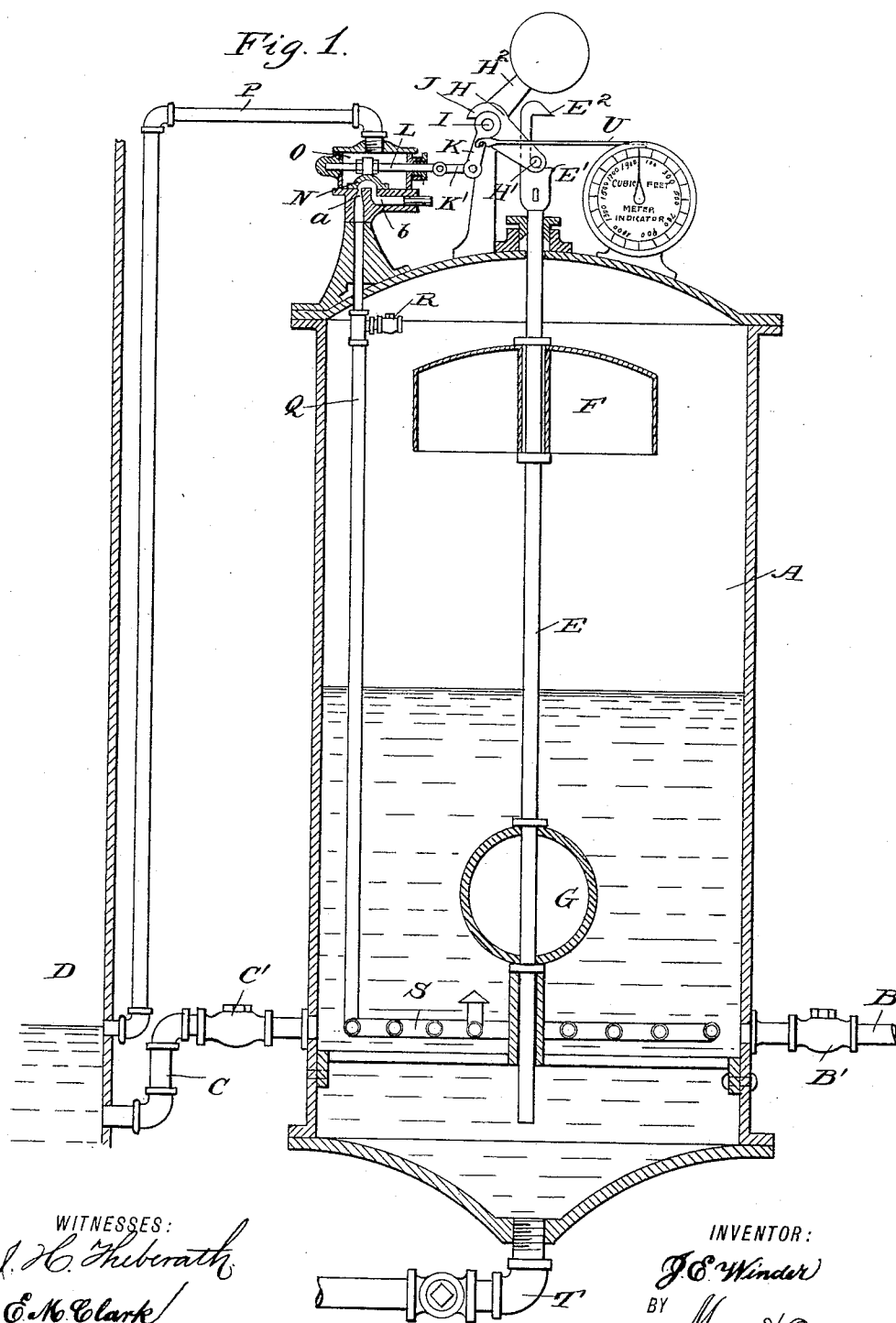
(No Model.)

2 Sheets—Sheet 1.

J. E. WINDER.
BOILER FEEDER AND METER.

No. 450,902.

Patented Apr. 21, 1891.



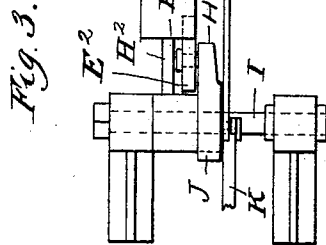
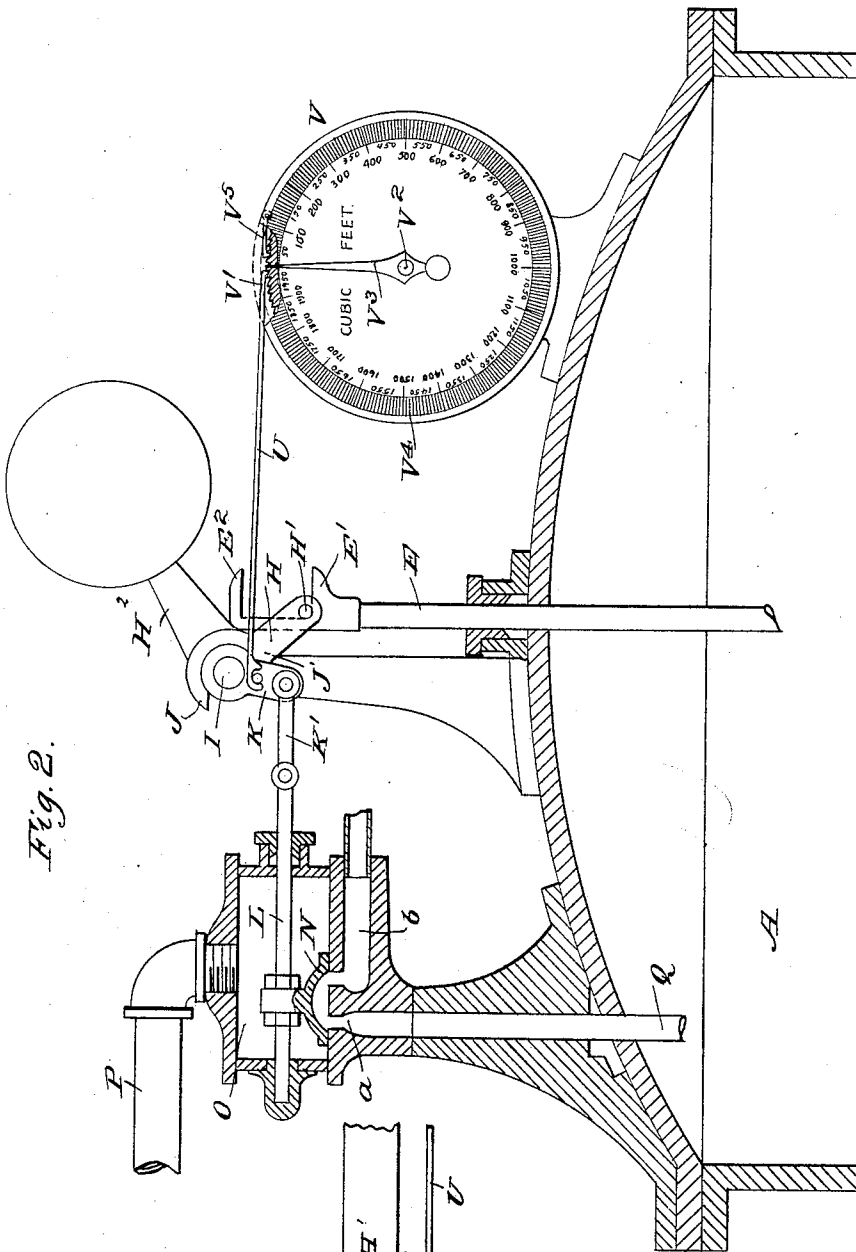
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WITNESSES:
J. H. Thebrath
E. M. Clark

INVENTOR:
J. C. Winder
BY *Munn & Co*
ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN E. WINDER, OF PACIFIC, MISSOURI.

BOILER FEEDER AND METER.

SPECIFICATION forming part of Letters Patent No. 450,902, dated April 21, 1891.

Application filed September 3, 1890. Serial No. 363,802. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. WINDER, of Pacific, in the county of Franklin and State of Missouri, have invented a new and Improved Boiler Feeder and Meter, of which the following is a full, clear, and exact description.

The invention relates to boiler-feeders such as shown and described in the United States Letters Patent No. 385,893, granted to me July 10, 1888.

The object of the invention is to provide a new and improved boiler feeder and meter which is simple and durable in construction, very effective and automatic in operation, and registers the quantity of water used.

The invention consists of a water-receptacle connected with the boiler and containing a float, a steam-chest connected with the said receptacle and with the boiler, and a valve held in the said steam-chest.

The invention also consists in certain parts and details and combinations of the same as will be described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement as applied. Fig. 2 is an enlarged sectional side elevation of part of the improvement, and Fig. 3 is a plan view of part of the improvement.

The improved boiler feeder and meter is provided with a water-receptacle A, into the lower part of which leads a water-supply pipe B, containing a check-valve B'. Opposite this pipe B is arranged a discharge-pipe C, also provided with a check-valve C' and connecting the water-receptacle A with the boiler D at any desired point.

In the water-receptacle A is fitted to slide vertically a rod E, the upper end of which extends through a suitable stuffing-box in the upper end of the water-receptacle A. On the lower part of the rod E is secured a float G, so constructed as to have sufficient buoyancy to sustain its own weight when submerged and exerting its force on the rod E only when the water-receptacle is empty—that is, when the water is below the said float G. Near the upper end of the rod E, within the receptacle

A, is secured a second float F, which is open at the bottom and acts as a float only when the receptacle A is nearly full of water.

On the outer end of the rod E are formed two lugs E' and E², adapted to engage a pin H', held on an arm H, mounted to turn loosely on a shaft I, mounted in suitable bearings secured to the top of the water-receptacle A. From the arm H extends a second arm H², carrying a weight. The arms H and H² form a bell-crank lever, which is provided with projections J and J', adapted to alternately engage the arm K, secured on shaft I, so as to turn the latter when the bell-crank lever changes its position, as hereinafter more fully described. The arm K is pivotally connected by a link K' with the valve-stem L, carrying the ordinary slide-valve N, fitted to slide in the steam-chest O, supported on top of the receptacle A and connected by a pipe P with the steam-compartment of the boiler D at the water-level. The slide-valve N is adapted to operate over the ports a and b, of which the latter is an exhaust-port and leads to the outside, while the port a connects with the pipe Q, extending into the receptacle A and carrying in a short branch pipe near its upper end a check-valve R. The lower end of the pipe Q, is formed into a horizontally-extending coil S, similar in construction to the coil shown in the patent above referred to and for the same purpose. The coil S is about in line with the pipes B and C. From the bottom of the receptacle A leads a blow-off pipe T, constructed in the usual manner.

The arm K previously mentioned is connected by a pawl U with a ratchet-wheel V' of the meter or registering device V, arranged on the top of the receptacle A. This meter V has the ratchet-wheel V', secured on a shaft V², mounted to turn in the casing of the indicator and carrying at its front end a pointer V³, indicating on dial V⁴. A dog V⁵ is held on the casing of the indicator and engages the ratchet-wheel V' to prevent a return movement of the latter. When the arm K swings from the left to the right, the pawl U shifts the ratchet-wheel so that the shaft V² is turned, and the pointer V³ moves to the next graduation on the dial V⁴. This movement of the arm K takes place every time the receptacle fills with water, and as the cubic con-

tents of the receptacle A are known a full registration of the entire amount of water taken into the receptacle is indicated on the register or meter V.

5 The operation of the feeder is as follows: When the slide-valve N is in the position shown in the drawings, the pipe Q is connected by the ports *a* and *b* with the outside, and the steam from the boiler D is shut off
10 from the receptacle A. As the check-valve B' in the water-supply pipe B is free to open, the water enters the receptacle and fills the same, the check-valve C' being closed by the boiler-pressure, while the check-valve
15 R opens to let out the air in the upper part of the receptacle A. When the receptacle A is nearly filled with water, the float F rises and moves the rod E in an upward direction, so that the lug E', acting on the pin H' of
20 the arm H, swings the latter, so that the weighted arm H² passes beyond the vertical position and is then thrown downward quickly by the weight, whereby the lug J, acting on the arm K, swings the latter to the right,
25 thereby shifting the valve N so that the port *a* is opened while the port *b* is closed. This movement of the lever K actuates the pointer V³ on the dial, as previously described, so that the amount of water admitted to the re-
30 ceptacle A is registered. The steam from the boiler D can now pass through the pipe P, through the steam-chest O into the port *a*, and from the latter to the pipe Q to close the check-valve R and to pass through the coil
35 of pipe S in and through the water in the receptacle A to heat the same. The pressure in the receptacle A will now be equal to the boiler-pressure, so that the check-valve B' closes and the water-supply is shut off, and
40 at the same time the check-valve C' opens by the weight of the water contained in the receptacle A, so that whenever the water in the boiler is lower than pipe P, which enters the
45 boiler at a predetermined water-level, the water in feeder will seek a level in the boiler until said pipe P shall be covered or the proper level reached. When the water in
the receptacle A is nearly all discharged, the float G is uncovered and by its weight
50 draws the rod E downward, so that the upper lug E² acts on the pin H' to swing the arm H downward. This movement of the arm H causes the arm H² to swing until it finally passes a vertical position, after which the
55 weight suddenly throws the arm H² downward to the right, so that the projection J strikes the arm K, thus turning the same to the left, and thereby shifting the slide-valve N to the

position shown in the drawings. The steam from the boiler D passing through the pipe 60 P is now shut off, so that the check-valve C' closes, the valve B' in the supply-pipe B opens, the receptacle A is again filled with water, and the above-described operation is repeated. 65

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a boiler-feeder, the combination, with a water-receptacle connected with the boiler, 70 a steam-chest connected with the receptacle and the boiler, and a valve in the steam-chest, of a float-carrying rod mounted to slide in the receptacle and provided with lugs on its projecting end, a shaft provided with 75 a crank-arm connected with the said valve, and a bell-crank lever loosely mounted on the shaft and provided with projections for engaging the crank-arm, one of the arms of the bell-crank lever being weighted and the other 80 engaging the end of the float-rod, substantially as herein shown and described.

2. In a boiler-feeder, the combination, with a water-receptacle connected to the boiler and provided with a coil in its lower portion, 85 a steam-chest connected with the boiler and the said coil, and a slide-valve in the steam-chest, of a vertically-sliding rod in the receptacle and provided with lugs on its project- 90 ing end, two floats on the said rod, a shaft provided with a crank-arm connected to the slide-valve, and a bell-crank lever loosely mounted on the shaft and provided with pro- 95 jections for engaging the crank-arm to move it, one of the arms of the bell-crank lever being weighted and the other engaging the end of the sliding rod, substantially as herein shown and described.

3. In a boiler-feeder, the combination, with a water-receptacle connected with the boiler, 100 a steam-chest connected with the receptacle and boiler, a valve in the steam-chest, and a float-carrying rod mounted to slide in the receptacle and provided with lugs on its project- 105 ing end, of a shaft provided with a crank-arm connected with the said valve, a weighted bell-crank lever mounted loosely on the shaft and provided with a projection for engaging the crank-arm, a registering device, and means for operating the registering device from the 110 crank-arm, substantially as herein shown and described.

JOHN E. WINDER.

Witnesses:

J. SPECK.

C. C. BIRKICHT.